ORA SOLAR FARM INSPECTION

InDroRobotics

Abstract

An ORA is a way to analyze a proposed ConOps and identify if there are sufficient mitigation means to conduct an operation with an acceptable level of risk. It provides a systematic methodology to identify in an holistic way risks associated to a UAS operation. This ORA report is based on SORA and 8040 SRM

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Initial Approval

Role	Name	Signature	Date
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Approved	Philip Reece		Oct 19, 2021

Revision History

Rev	Author	Change Description	Release Date

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Introduction

This document presents a Specific Operation Risk Assessment for the use of IndroRobotics Aircraft to meet the operational requirements outlined in FAA orders for waiver and exemptions operations in solar energy farms.

Annex A provides a functional hazard assessment supporting the analysis done herein

Reference Documents

Consencu Standards

- JARUS guidelines on Specific Operations Risk Assessment (SORA) V2.0 dated 30.01.2019

FAA

- FAA Order 8040.4B Safety Risk Management Policy
- FAA Order 8040.6 Unmanned Aircraft Systems Safety Risk Management Policy
- FAA Order 8000.369, Safety Management System

Internal

1) Indro SOP OPS-004 Amendment 9 Dated October 8th, 2021
2) Indro Training Document Number: OPS-002 Published 30 April 2016 Updated 17 July 2020, AL-4
3) Flight and Maintenance Manual Endurance Document OPS-019 Dated October 21, AL-4
4) Flight and Maintenance Manual InDro Wayfinder Document number: OPS-26 Dated 20 July 2020
5) InDro Document Number: OPS-020 SMS program Dated March 2020 AL 5
6) INDRO-CONOPS-001 Rev NC Dated October 13th
7) InDro Document Number: OPS-020 SMS program Amendment List 1 – 5 Dated March 2020

Step 1: CONOPS

Indro Robotics designs, manufacture, and operates Unmanned Aircraft Systems (UAS) for the global civilian market. Indro Robotics headquarter is located in Vancouver, British Columbia, Canada. Indro Robotics has successfully operated in several countries and has an excellent safety track record on its operations and UASs that it has designed/manufactured.

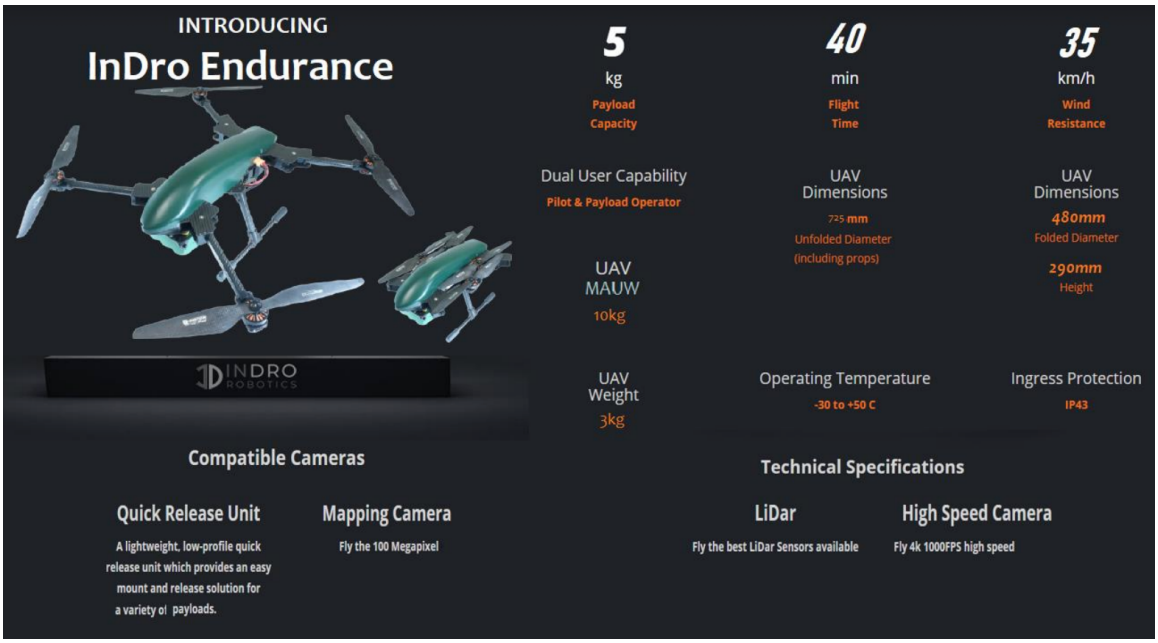
Indro Robotics proposed to operate two small U.A. under 55 pounds called Wayfinder and Endurance for inspections within the confined area of a solar energy farm. These UASs will strictly operate per the requirements and limitations of this concept of operation (CONOPs), based on FAA Order 8040.6 Unmanned Aircraft Systems Safety Risk Management Policy guidance. The IndroWayfinderr and Endurance have a risk classification of 1 per FAA UAS certification guidance. Herein is referred to as RC-1 UAS.

The RC-1 UAS will fly inspections and collecting data in support of solar energy farms. These operations are contained within the energy solar farm location,s which are fenced. The operations are carried out within PART 107 regulatory framework/

For the mission types under this CONOP, there are key characteristics:

- Risk Class: RC-1 (kinetic energy-based)
- Mission: Data collection with onboard sensors including LIDAR, infra-red, Electro-Optical.
- Pilot minimum qualifications:
  - ✓ FAA Remote Airman Certificate;
  - ✓ System and platform-specific training, including Aircraft certifications; and
  - ✓ Recurrent Aircraft flight training.
- Aircraft/Operator Ratio: One Aircraft—One PIC.
- Flights occur in contained areas in solar energy farms generally located in less populated areas with a population density of fewer than 500 people per Square mile.
- The operations are not done in population centers.
- Flights in VMC conditions.
- Day operations.
- Visual Line-of-Sight (VLOS) operation supported by Visual Observer (onsite) and PIC (Offsite).
- Maximum Operating Altitude: 115 feet above ground level (AGL).
- Flight in icing conditions: Prohibited
- Flight in visible moisture: Prohibited
- Launch and Recovery: The launch and Recovery occur within the fenced perimeter of the solar energy farm
- Minimum Crew for Operation: 2
  - ✓ 1 PIC (Offsite);
  - ✓ 1 Visual Observer (on-site);

Figure 1 - 3D View Endurance



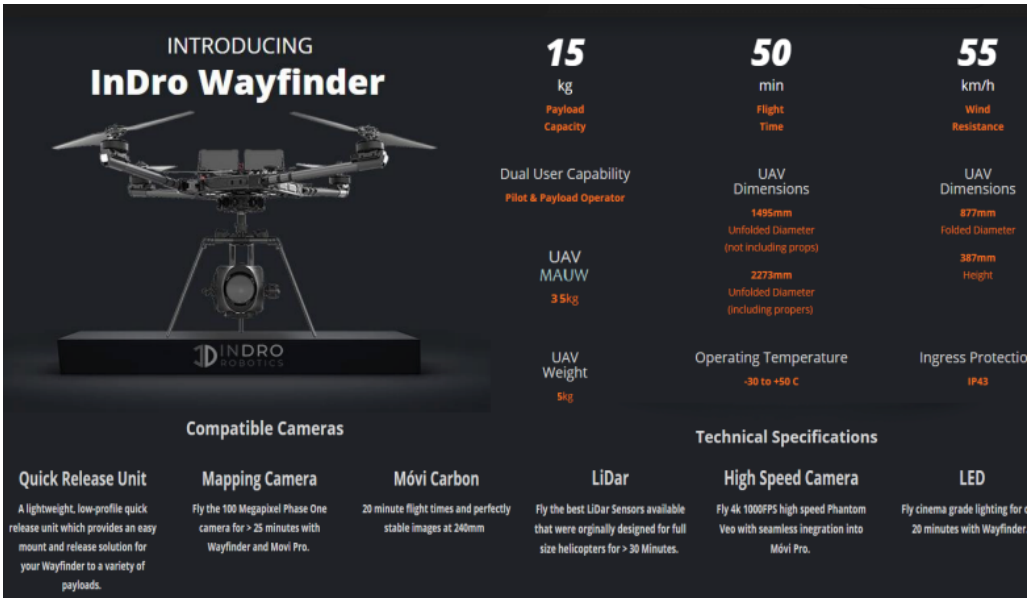


Figure 2 - Wayfinder 3 3D View

Step2: Determine the initial Ground Risk Class (GRC)

Table 1 - GRC without reduction considerations

Max RPAS Characteristic Dimension	1 m / approx. 3 ft	3 m / approx. 10 ft	8 m / approx. 25 ft	> 8 m / approx. 25 ft
Typical Kinetic Energy Expected	< 700 J	< 34 kJ	< 1084 kJ	> 1084 kJ
Operational Scenarios	Intrinsic GRC			
VLOS/BVLOS over-controlled ground area	1	2	3	4
VLOS outside of a population center	2	3	4	5
BVLOS outside of a population center	3	4	5	6
VLOS within a population center	4	5	6	8
BVLOS within a population center	5	6	8	10
VLOS over a gathering of people	7			
BVLOS over a gathering of people	8			

As defined in the CONOPS, the operational scenario under consideration is BVLOS outside a population center and an over-controlled ground Area. The two aircraft have different intrinsic ground risks since Indro's Wayfinder has more significant dimensions 2,2 meters, an intrinsic ground risk of 2 is used in this document

Step 3: Final GRC determination

Table 2 - GRC with Reduction Considerations

		Robustness			
Mitigation Number	GRC Adaptation	Low/None	Medium	High	Correction
M1	Strategic Mitigations for Ground Risk	0: None -1: Low	-2	-4	-2
M2	Effects of ground impact are reduced	0	-1	-2	0
M3	An Emergency Response Plan is in place. Operator validated and effective	1	0	-1	0
				Total Correction:	-2

Justify mitigations in the table below:

Table 3 - Justification

Mitigation	Proposed Robustness Level	Justification
M1 Technical Containment	Medium	IndroRobotics UAS possesses an excellent in-service history track record. The U.A. has been used in similar operations in similar operations as proposed in the CONOPS
M2	None	No credit is being sought for ground impact mitigations.
M3 – ERP	Medium	The emergency response plan is operationally defined in an emergency procedures document. It has been practiced and reviewed. Therefore, the robustness of this mitigation is considered high. Indro has used these processes in several operations, and Transport Canada has provided Indro with BVLOS operations

Conclusion: The strategic mitigations reduce the ground risk class by 0. Therefore, the final GRC for this operation is 0.

Step 4: Determine the Initial Air Risk Class (ARC)

The operations occur in Class G airspace (The Solar Farms are fenced, and the Visual Observer can have control of who is present during the operations)

Table 4 - GRC and ARC Combined

Flight Phase	Ground Risk Scenario	GRC	GRC with Reduction	Atypical Airspace ?	Altitude	In Airport Environment ?	Airspace Class	Mode C / TMZ?	**ARC**
Takeoff	BVLOS outside of a Population Centre	2	0	No	<400 ft AGL	No	G	No	**b**
Transit	BVLOS outside of a Population Centre	2	0	No	<400 ft AGL	No	G	No	**b**
Survey	BVLOS outside of a Population Centre	2	0	No	<400 ft AGL	No	G	No	**b**

Flight Phase	Ground Risk Scenario	GRC	GRC with Reduction	Atypical Airspace ?	Altitude	In Airport Environment ?	Airspace Class	Mode C / TMZ?	**ARC**
Transit	BVLOS outside of a Population Centre	2	0	No	<400 ft AGL	No	G	No	**b**
Landing	VLOS outside of a Population Centre	2	0	No	<400 ft AGL	No	G	No	**b**

Step 5: Strategic Mitigations to determine the final ARC

As the initial ARC is ARC-b for this operation, no additional strategic mitigations will be implemented.

Step 6: Tactical Mitigation Performance Requirements and Robustness Levels

Table 5 - TMPR Requirements Table

Air Risk Class	Tactical Mitigation Performance Requirement (TMPR)	TMPR Robustness	TMPR System Risk Ratio Guidance
ARC-d	High Performance	High Robustness	System Risk Ratio ≤ 0.1
ARC-c	Medium Performance	Medium Robustness	System Risk Ratio ≤ 0.33
ARC-b	Low Performance	Low Robustness	System Risk Ratio ≤ 0.66
ARC-a	No Performance Requirement	No Robustness Requirement	No System Risk Ratio guidance, although the applicant may still need to show some form of mitigation as deemed necessary by the CAA

The SORA TMPR is based on the findings of several studies. These studies provide performance guidance using Risk Ratios. Table 5 shows the SORA TMPR Risk Ratio Requirements derived from those studies demonstrated in JARUS SORA documents (click here).

The DAA plan for Aircraft to support operation with ARC-c plan relies on the following systems or services:

1) Visual Observer in the area of the operation
2) Active communication with ATC and other airspace users.
3) NOTAM

Step 7: Specific Assurance and Integrity Levels (SAIL) Determination

Table 6 - SAIL Determination Table

SAIL Determination				
	Final Air Risk Class (ARC)			
Final GRC	a	b	**c**	d
1	I	II	IV	VI
2	I	II	IV	VI
3	II	II	IV	VI
4	III	III	IV	VI
5	IV	IV	IV	VI
6	V	V	V	VI
7	VI	VI	VI	VI
>7	Category C (Certified)			

The combination of ARC-b and GRC 1 sets the SAIL determination for this operation to SAIL II.

Step 8: Identification of Operational Safety Objectives (OSO)

Table 7 - OSO Justification

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
1	Technical Issue with the UAS	Ensure the Operator is competent and proven.	L	INTEGRITY REQUIREMENT *The applicant is knowledgeable of the UAS being used and, as a minimum has the following relevant operational procedures: checklists, maintenance, training, responsibilities, and associated duties.* ASSURANCE REQUIREMENT *The elements delineated in the level of integrity are addressed in the ConOps.* **COMPLIANCE**: Indro has a comprehensive training plan for Aircraft operators, and operators must have appropriate pilot training. The training includes crew responsibilities and conduct, aircraft mechanisms and systems, ground system and communications components, normal procedures, emergency procedures, aircraft, and operating environmental limitations. In addition, detailed recurrent training requirements have been specified for each operator position in the aircrew.
2	Technical Issue with the UAS	UAS manufactured by a competent and proven entity	O	INTEGRITY REQUIREMENT As a minimum, manufacturing procedures cover: • specification of materials • suitability and durability of materials used, • processes necessary to allow for repeatability in manufacturing and conformity within acceptable tolerances. ASSURANCE REQUIREMENT *The declared manufacturing procedures are developed to a standard considered adequate by the competent authority and/or per a means of compliance acceptable to that authority* **COMPLIANCE**: Indro possesses an extensive in-service history and operation in diverse operational

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				environments. The Aircraft has 300 flight hours and maintain an excellent safety track record
3	Technical Issue with the UAS	UAS maintained by the competent and proven entity	L	INTEGRITY REQUIREMENT • The UAS maintenance instructions are defined and, when applicable, cover the UAS designer instructions and requirements. • The maintenance staff is competent and has received authorization to carry out UAS maintenance. • The maintenance staff uses the UAS maintenance instructions while performing maintenance. ASSURANCE REQUIREMENT • *The maintenance instructions are* • *documented.* • *The maintenance conducted on the UAS is recorded in a maintenance log system* • *A list of maintenance staff authorized to carry out maintenance is established and kept up to date.* **COMPLIANCE**: Indro has detailed maintenance documentation and procedures for maintaining the Aircraft by appropriately trained maintenance technicians. All work on the Aircraft aircraft is documented in the aircraft logbook. Indro training materials are used for all aircraft-related maintenance and repair. Indro has prepared detailed maintenance training materials.
4	Technical Issue with the UAS	UAS developed to authority recognized design standards.	O	INTEGRITY REQUIREMENT *The UAS is designed to standards considered adequate by the competent authority and/or per a means of compliance acceptable to that authority. The standards and/or the means of compliance should apply to a Low Level of Integrity and the intended operation* ASSURANCE REQUIREMENT *The applicant declares that the required level of integrity has been achieved*

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				COMPLIANCE: Indro has an extensive service experience with these two UASs.
5	Technical Issue with the UAS	UAS is designed considering system safety and reliability	O	INTEGRITY REQUIREMENT *The equipment, systems, and installations are designed to minimize hazards1 in the event of a probable2 malfunction or failure of the UAS* ASSURANCE REQUIREMENT *A Functional Hazard Assessment and a design and installation appraisal that shows hazards are minimized are available.* **COMPLIANCE**: Refer to Appendix A of this document. **Note:** Severity of failures conditions (No Safety Effect, Minor, Major, Hazardous, and Catastrophic) should be determined according to the definitions provided in FAA Order 8040.4 and 8040.6
6	Technical Issue with the UAS	C3 link performance is appropriate for the operation	L	INTEGRITY REQUIREMENT • *The applicant determines that performance, R.F. spectrum usage, and environmental conditions for C3 links are adequate to conduct the intended operation safely.* • *The UAS remote pilot can monitor the C3 performance continuously and ensure the routine meets the operational requirements.* ASSURANCE REQUIREMENT *The applicant declares that the required level of integrity has been achieved* **COMPLIANCE**: Indro follows CFR Title 47 Part 15 Federal Communication Commission (FCC) rules, by showing the UAS equipment is compliant with these requirements, e.g., FCC marking, emission testing.

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				In addition, the use of mechanisms to protect against interference as defined in the CONOPS, and SOP Indro's remote Pilot has continual and timely access to the relevant C3 information that could affect flight safety. For example, in the ground control station, the Pilot can monitor the C2 link signal strength and receive an alert from the GCS if the signal becomes too low. Then, per Indro SOP, the PIC starts RTH operations.
7	Technical Issue with the UAS	Inspection of UAS (product inspection) to ensure consistency to the CONOPS	L	INTEGRITY REQUIREMENT *The remote crew ensures the UAS is in a condition for safe operation and conforms to the approved concept of operations.* ASSURANCE REQUIREMENT *Product inspection is documented and accounts for the manufacturer's recommendations if available* **COMPLIANCE**: A preflight checklist is used to ensure that the aircraft and supporting ground systems are ready to perform their intended functions and are within normal parameters. The aircraft preflight is conducted IAW SOP. In general, the system is initialized by applying power to the Aircraft and allowing the inertial components to align and GPS to acquire a position solution. These procedures are covered during Indro's training on standard aircraft procedures.

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment

8	Technical Issue with the UAS	Operational procedures are defined, validated, and adhered to.	M	INTEGRITY REQUIREMENT
				• *Operational procedures appropriate for the proposed operation are defined and, as a minimum, cover the following elements:*
				  ○ *Flight planning,*
				  ○ *Pre and post-flight inspections,*
				  ○ *Procedures to evaluating environmental conditions before and during the mission (i.e., real-time evaluation),*
				  ○ *Procedures to cope with unintended adverse operating conditions (e.g., when ice is encountered during an*
				  ○ *operation not approved for icing conditions)*
				  ○ *Normal procedures,*
				  ○ *Contingency procedures (to cope with abnormal situations),*
				  ○ *Emergency procedures (to cope with emergencies), and*
				  ○ *Occurrence reporting procedures.*
				• *Normal, Contingency and Emergency procedures are compiled in an Operation Manual.*
				• *At a minimum, operational procedures provide:*
				  ○ *a clear distribution and assignment of tasks*
				  ○ *an internal checklist to ensure staff is adequately performing assigned duties.*
				• *Contingency/emergency procedures require manual control by the remote Pilot when the UAS is usually automatically controlled*
				• *Operational procedures consider a human error.*
				
				ASSURANCE REQUIREMENT
				• *Operational procedures are validated against standards considered adequate by the competent authority and/or per a means of compliance acceptable to that authority1*
				• *Adequacy of the Contingency and Emergency procedures is proven through:*

11	Deterioration of external systems supporting UAS operation	Procedures are in place to handle the deterioration of external systems supporting UAS operation.	M	
14	Human Error	Operational procedures are defined, validated, and adhered to	M	
21	Adverse Operating Conditions	Operational procedures are defined, validated, and adhered to	M	

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				○ *Dedicated flight tests or o Simulations provided the simulation is proven valid for the intended purpose with positive results.* **COMPLIANCE**: Indro flight manual for the UASs includes detailed checklists for both normal and emergency procedures. Indro SOP The operational checklist has been developed by Indro pilots and validated through analysis, simulation, and flight testing. Indro training procedures focus extensively on these procedures as well as crew coordination and crew resource management.
9	Technical Issue with the UAS	Remote crew trained and current and able to control the abnormal situation	L	INTEGRITY REQUIREMENT *The competency-based, theoretical and practical training ensures knowledge of:* *a) UAS regulation* *b) UAS airspace operating principles* *c) Airmanship and aviation safety* *d) Human performance limitations* *e) Meteorology* *f) Navigation/Charts* *g) U.A. knowledge* *h) Operating procedures* *and is adequate for the operation.* ASSURANCE REQUIREMENT • *Training is self-declared (with the evidence available).* **COMPLIANCE**: Indro's training program, in conjunction with the pilot training required to be eligible to be a remote pilot for Indro, covers all of these topics in the training syllabus.
15	Human Error	Remote crew trained and current and able to control the abnormal situation	L	
22	Adverse Operating Conditions	The remote crew is trained to identify critical environmental conditions and to avoid them.	L	
10	Technical Issue with the UAS	Safe Recovery from a technical issue.	L	INTEGRITY REQUIREMENT *When operating over populated areas or gatherings of people, it can be reasonably expected that a fatality will not occur from any*

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
12	Deterioration of external systems supporting UAS operation	The UAS is designed to manage the deterioration of external systems supporting UAS operation.	L	*probable failure of the UAS or any external system supporting the operation.* ASSURANCE REQUIREMENT *A design and installation appraisal is available. In particular, this appraisal shows that:* • *the design and installation features (independence, separation, and redundancy) satisfy the low integrity criterion;* • *particular hazards relevant to the ConOps (e.g., hail, ice, snow, electro-magnetic interference…) do not violate the independence claims if any.* **COMPLIANCE**: No Operations overpopulated area, and no operation on IMC conditions or FIKI The Aircraft operates in a controlled ground, VMC, and day conditions.
13	Deterioration of external systems supporting UAS operation	External services supporting UAS operations are adequate for the operation	L	INTEGRITY REQUIREMENT *The applicant ensures that the level of performance for any externally provided service necessary for the safety of the flight is adequate for the intended operation. If the externally provided service requires communication between the operator and service provider, the applicant ensures effective communication to support the service provisions. Roles and responsibilities between the applicant and the external service provider are defined.* ASSURANCE REQUIREMENT *The applicant declares that the requested level of performance for any externally provided service necessary for the safety of the flight is achieved (without evidence being necessarily available).* **COMPLIANCE**: The communication between the V.O. and the Pilot is done thru a cellular. The transmission is done thru a dual cell with a fallback (if one goes out, the other auto kicks in, it has the ability through the cradle point modem). If both cellular services do

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				not operate properly, and already set up iPad (in the box) starts to give automatic instructions to the V.O., such as "the drone will hover for 20 seconds then return home to the takeoff point. The iPad will give instructions to the V.O.; for example, please ensure the takeoff point is clear. If necessary, press abort and the drone will descend to the ground at its current location." The drone would also start a loss link RTL, the loss link procedures if no cellular connection is detected (although in truth, it wouldn't be a loss link as the link to the drone is to the cell, not the cell link to the Pilot that is just for c2 (command and control. Indro posses SOPS for different types of failures, such as : • SOPs 2.3.5 - Control Station Failure • SOPs 2.3.6 - Communications Failure • SOPs 2.3.7 - Command and Control Link Failure
16	Human Error	Multi-crew coordination	L	INTEGRITY REQUIREMENT *Procedure(s) to ensure coordination between the crew members and robust and effective communication channels is (are) available and at a minimum cover:* • *assignment of tasks to the crew,* • *establishment of step-by-step communications.* *Remote Crew training covers multi-crew coordination* ASSURANCE REQUIREMENT • *Procedures do not require validation against either a standard or a means of compliance considered adequate by the competent authority.* • *The adequacy of the procedures and checklists is declared* • *Training is self-declared (with the evidence available)* **COMPLIANCE**:

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				Indro's document SOP includes detailed normal and emergency checklists that identify the crew member responsible for each step in the checklist. Crew position responsibilities and Crew Resource Management are an integral part of Indro's remote operator training. The checklists and procedures have been developed and demonstrated to be effective by Indro's engineers, test pilots by flight test.
17	Human Error	Remote crew is fit to operate.	L	INTEGRITY REQUIREMENT *The applicant has a policy defining how the remote crew can declare themselves fit to operate before conducting any operation.* ASSURANCE REQUIREMENT • *The policy defines how the remote crew declares themselves fit to operate (before an operation) is documented.* • *The remote crew declaration of fit to operate (before an operation) is based on policy defined by the applicant.* **COMPLIANCE**: Indro's SOPs define standard operating procedures for the pilots. In addition, the document includes guidance on Flight and Duty Time Limitations, Alcohol and Other Psychoactive Substances, and Health Issues. Indro SMS has been successful in mantaing safety a promoting a safety culture in the organization.
18	Human Error	Automatic protection of the flight envelope from Human Error	O	INTEGRITY REQUIREMENT *The UAS flight control system incorporates automatic protection of the flight envelope to prevent the remote Pilot from making any single input under normal operating conditions that would cause the U.A. to exceed its flight envelope or prevent it from recovering in a timely fashion.* ASSURANCE REQUIREMENT

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				The automatic protection of the flight envelope has been developed inhouse or out of the box (e.g., using Component Off The Shelf elements), without following specific standards. **COMPLIANCE**: The U.A. flight control system limits the commandable flight envelope to avoid pilot entry errors that command unsafe operations. Flightpath checks are also implemented to warn the remote operator if the Aircraft is not following the commanded flight path. Additionally, the Aircraft's Flight Control System limits bank angle, airspeed, and vertical speed. The system requirements were developed that specify control modes, specific functionality, and desired level of performance. Software and hardware (in-the-loop) testing was used to develop, test, and integrate software and hardware components.

19	Human Error	Safe Recovery from human error.	O	INTEGRITY REQUIREMENT
				Procedures and checklists that mitigate the risk of potential human errors from any person involved with the mission are defined and used.
				
				• *Procedures provide at a minimum:*
				  ○ *a clear distribution and assignment of tasks,*
				  ○ *an internal checklist to ensure staff is adequately performing assigned duties.*
				• *The Remote Crew is trained to procedures and checklists.*
				• *In addition, the Remote Crew receives Crew Resource Management (CRM) training.*
				
				Systems detecting and recovering from human errors are developed to industry best practices.
				
				ASSURANCE REQUIREMENT
				Procedures and checklists do not require validation against either a standard or a means of

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
				compliance considered adequate by the competent authority. *The adequacy of the procedures and checklists is declared.* **COMPLIANCE**: Indro has developed a comprehensive checklist, and SOPs/ checklists have been developed by Indro's test pilot's flight testing and service experience (2000 Hours). In addition, Indro's training procedures focus extensively on these procedures and crew coordination and crew resource management.
20	Human Error	A Human Factors evaluation has been performed, and the HMI was found appropriate for the mission.	L	INTEGRITY REQUIREMENT *The UAS information and control interfaces are clearly and succinctly presented and do not confuse, cause unreasonable fatigue, or contribute to remote crew error that could adversely affect the safety of the operation.* ASSURANCE REQUIREMENT *The applicant conducts a human factors evaluation of the UAS to determine if the HMI is appropriate for the mission. The HMI evaluation is based on demonstrations or simulations.* **COMPLIANCE**: The Aircraft command and control workstation is based on a commercial UAS control software platform used on multiple UAS programs. In addition to the external vendor's HMI evaluations, the system has been extensively tested internally in both simulation and flight tests by Indro test pilots to ensure that the interface is appropriate for mission needs.
23	Adverse Operating Conditions	Environmental conditions for safe operations are defined, measurable,	L	INTEGRITY REQUIREMENT • *Environmental conditions for safe operations are defined and reflected in the flight manual or equivalent document.* • *Procedures to evaluate environmental conditions before and during the mission (i.e., real-time evaluation) are available and include*

OSO Number	Category	Technical Issue with the UAS	SAIL II	Comment
		and adhered to.		*assessing meteorological conditions (METAR, TAFOR, etc.) with a simple recording system.* • *Training covers the assessment of meteorological conditions.* ASSURANCE REQUIREMENT • *Procedures do not require validation against either a standard or a means of compliance considered adequate by the competent authority.* • *The adequacy of the procedures and checklists is declared.* **COMPLIANCE**: Indro has a complete flight manual for the UAS. This flight manual and SOPs include environmental limitations for the Aircraft. Additionally, ndro pilots are required to have Part 107 UAS training. Part of pilots' initial and recurrent training is aeronautical decision-making and tools for assessing current and forecast meteorological conditions (e.g., METAR, TAFs, etc.). Indro training procedures cover all of the documents listed above as well as the applicable FAR sections.
24	Adverse Operating Conditions	UAS designed and qualified for adverse environmental conditions	O	NA

Step 9: Adjacent Area/Airspace Considerations

Airspaces and ground areas adjacent to the planned operating area follows the following criteria needing 'advanced' containment are:

☐ The operational volume is not adjacent to gatherings of people unless already approved for operations over gatherings of people; or

☐ The operational volume is not adjacent to class B or C airspace unless already approved for operations by FAA; or

☐ No flying in proximities of population centers;

☐ The operation is conducted over a controlled ground area in a rural setting and Class G airspace.

There are no gatherings of people within the operational range of either Aircraft. We have not applied ground risk mitigation M1, and we are conducting the operation over a controlled ground area. In addition, the scenarios show that the operations are not carrying ARC-d airspace, so only 'basic' containment is required for all scenarios

Conclusion

All Scenarios provided present the same SAIL number II. Therefore, Indro mitigation offers a good level of assurance for all the scenarios and shows compliance with UAS Operational Risk Assessment OSOs.

Annex A provides further evidence that Indro operations under the operational environment defined in this CONOPS are safe and the SOP, checklists and training are adequate for this operation.

Appendix A - 8040 SRM

Refer to attached excel file INDRO-ORA-001 APPENDIX A

INDRO-ORA-001 NC October 17th

Final Audit Report 2021-10-19

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